

Finanziato dall'Unione europea NextGenerationEU







PNRR_IRIS WP2

Lucia Sabbatini (INFN-LNF)



18.07.2023











IRIS – WP2

- GOAL: commissioning at LNF of a **Magnetic Measurements Laboratory** for testing superconducting coils and magnets at room temperatures.
- The new instruments will integrate the equipment already available at LNF and used for electromagnets, with a revamping of the facility.
- The Laboratory will be able to perform:
 - magnetic measurements at room temperature;
 - electrical test of power supplies and magnets;
 - magnets design and engineering.











IRIS – WP2 Budget

Overall WP2 budget: 1.120.033 €



item	expected cost (€)	item	expected cost (€)	
5 axis mov system	150.000	Technologist	56.760	+100.000
Pulsed wire bench	100.000	Technician	100.000	,
Hall probe mole bench	240.000	Technician	100.000	
Calibration magnets	100.000	Training	40.000	
Calibrated probes	40.000	Indirect costs	73.273	+7.000
Power supplies	100.000			
Ancillaries	20.000			



Riunione Responsabili Progetto e Servizio – L. Sabbatini



Finanziato dall'Unione europea NextGenerationEU







5 axis mov. system

Pulsed wire

Mole hall probe

- stages & electronics
- mechanics
- probe & holders

- stages & electronics
- granite support
- laser, photodiode, software
- for small aperture magnets
- 3d probe
- exploring different options













Activities in progress - IRIS

- Hall probe bench: tech specs, order; installation of new linear and rotational stages, upgrade of mechanics, upgrade of electronics, new holders with different geometris, review of Vis.
- **Mole system:** meetings with Kyma to define tech specs of the new system; order.
- Pulsed wire: tech specs, order. Installation and integration of sub-systems: positioning and alignment of granite blocks, positioning and alignment of linear stages, installation ad calibration of laser, photodiode and readout electronics.
- **Power supplies:** tests of PS acquired by CAEN-ELS (delivery: end of July)
- **Calibrated magnets**: meetings with CERN to define tech specs, order. Measurements with multiple devices for complete characterization
- Ancillaries: list to be defined in detail according to laboratory needs; orders.
- Rearrangements of laboratory spaces: decluttering and rationalization of spaces in order to host the new benches and instruments
- Training:

measures: hands on activities for learning how to use different benches (alignement, acquisition system, analysis, ..). **courses:** CAS (2 weeks, 3 pax), OPERA, Modeling and control of power electronics, IMMW,











Activities in progress

SIG:

- MedAustron power supplies: installation and tests
- Setup for eddy currents measures: induction coils, mechanical support, acquisition system
- **TULIP magnets measurements**: twin magnets to be tested (FeCo and FeSi). Magnetic measures include hysteretic behaviour (ongoing on FeCo) and eddy currents.

SPARC:

• **PMQ measurments**: with stretched wire bench

LATINO

- **Rotating coil bench:** installation of new coil, design of final bench (support of Mechanical Engineers) **SABINA:**
- FBG measurements of undulator #1: in collaboration with ENEA & Mechanical Eng.
- Intraundulator steerer: design, fabrication (support of SIM), magnetic and thermal measurements, installation.
- Linac and Dogleg magnets: Follow-up of the two solenoids F.A.T.s, disconnection and re-cabling of the magnets involved in the new layout upgrade. Istallation of all the new ones.





Finanziato dall'Unione europea NextGenerationEU







Activities in progress

STAR:

 Installation of all the power supplies, follow up of the cabling installation, preliminary low power test. Upcoming activities: Nominal power test, interlockplc check, control system remote control test

ELI:

• Test of all the power supplies to check their status, installation of the power supplies at Magurele, follow up of all the installation phases and machine commisioning

OTHER

- FOOT: measurements of magnetic system (permanent mag. dipoles)
- **RomeTech:** design of the dump dipole for the Linac at TeX
- **DUNE**: Power Supply procurement, follow up of the preliminary test at LNF











Conclusions

- IRIS will play a crucial role in the upgrade of LNF magnetic laboratory facility allowing to realign LNF to international standards in the magnets and power supplies scenario.
- IRIS staff is just deeply involved in a lot of the LNF activities and projects. Several people are still in a training phase.
- A lot of calls for tenders are ongoing, very high effort needed to be on time with the PNRR deadlines.
- A relocation of the staff (especially technicians) on other time consuming activities , won't allow to fulfill the projects goals and could be self-defeating in this training phase.



